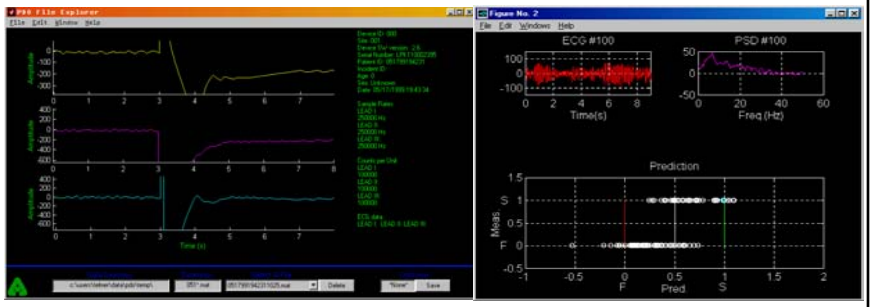
Broad Agency Announcement: DAAD05-03-T-0024
Mission Area: Investigative Support and Forensic (IS)
Requirement Number: R1088/IS-1088-ANLA-QC19
Proposal Title: Remote Diagnostics of Cardiac Rhythm

Argonne National Laboratory
May 30, 2003
Proprietary



Representative display of different stages of data analysis for interpretation of electrocardiogram (ECG) traces of cardiac arrhythmia

Operational Capability:

By using the available miniature sensor technology for recording and remotely transmitting physiological data, the software will provide real time interpretation of cardiac rhythm. Relevant features deduced from ECG tracing will be correlated with an individual's physical and mental state. The Emergency Resuscitation Center of the University of Chicago will provide the database and the medical expertise for interpreting cardiac activity.

- Noninvasive
- Remote operation
- Real-time response

Proposed Technical Approach:

Feasibility studies have been carried out at ANL on the application of modern data analysis algorithms to aid in interpreting ECG traces of cardiac arrhythmia. With the availability of miniature sensors and wireless transmission technology, physiological data can be analyzed remotely to infer vital information about the physical and mental state of individuals responding to or posing potential treat.

- **Task 1:** Compile a database using the available ECG recordings pertaining to various forms of cardiac arrhythmia.
- **Task 2:** Devise an optimal feature extraction routine to identify relevant trends in temporal and spectral data.
- **Task 3:** Implement multivariate data analysis and expert system algorithms.
- **Task 4:** Assess prediction capability by training on data from individuals under simulated stress conditions.
- **Task 5:** Integrate algorithms into a practical user interface.

ROM Cost & Schedule:

Data collection, algorithm implementation, and integration of routines into a single user interface.

- Total period of performance 24 months.
- Cost: $600K

Deliverables

- Monthly status reports
- Report describing the database and algorithms
- Final technical report

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